

INITIAL SITE EVALUATION

ECKMAN PROPERTY

(Madison County, I-270)

Illinois State Geological Survey
Lakes, Streams, and Wetlands Unit
615 East Peabody Drive
Champaign, IL 61820-6964

Submitted Under Contract No. AE89005 to
Illinois Department of Transportation
Bureau of Design and Environment, Wetlands Unit
2300 South Dirksen Parkway
Springfield, IL 62764

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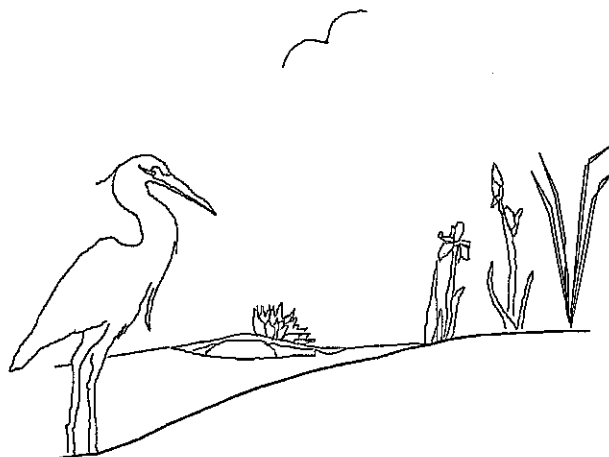
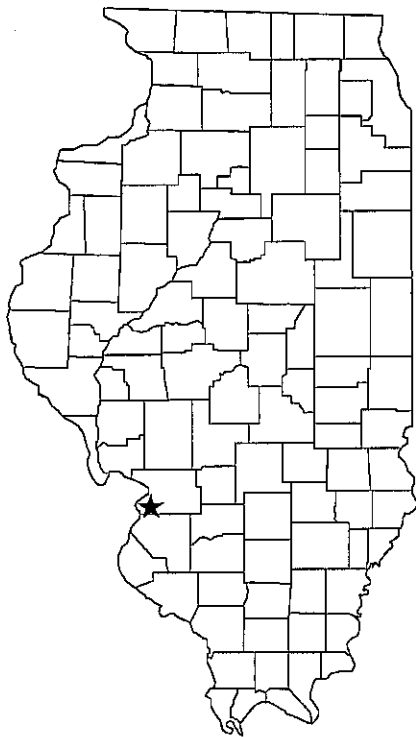


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INTRODUCTION

This report was prepared by the Illinois State Geological Survey (ISGS) to provide the Illinois Department of Transportation (IDOT) with preliminary information regarding the Eckman Property potential wetlands mitigation site for screening purposes only. File information and field observations of the hydrogeomorphic features of this site are the primary focus of this report. Biological features such as habitat are only included as part of a broad analysis of the landscape. Field observations may not reflect long-term conditions at this site. This report and any conclusions contained herein are not a substitute for a hydrogeologic characterization of this site, which may include geologic investigation, well installation, surveying, and long-term monitoring of site conditions.

The proposed mitigation site is located in southwestern Madison County 2.2 km (1.4 miles) west of Collinsville (Attachment 1). Detailed features of the proposed mitigation site are shown on Attachment 2.

DISCUSSION

The proposed mitigation site is part of a sediment-filled oxbow of the Mississippi River. A topographic map from the early 1900's shows that this abandoned channel was once the site of a long, continuous wetland that stretched from the present location of IL 162 south to the north edge of East St. Louis. Much of this wetland has been drained and the surrounding streams have been channelized.

The proposed mitigation site is a farm field with a history of flooding. The landowner claims that the ditch maintenance increased the flow in Schneider ditch causes water to back up through a culvert into his field (M. Vanderhoof, IDOT District 8, pers. comm.). The ditch originates east of I-255 and flows west along the south edge of his property.

Observations of surface-water flow during the initial site evaluation (ISE) showed that water flows onto the site from agricultural fields west and north of the proposed mitigation site. Surface-water appears to flow both into the proposed mitigation site from a small wetland immediately to the east (referred to as the east wetland) and into the east wetland from the proposed mitigation site (Attachment 2). Water discharges from the proposed mitigation site through a culvert into Schneider ditch.

The site appears to have high potential for restoration. Modifications required to restore wetland hydrology would most likely consist of blocking existing drainage from the proposed mitigation site. Additional study would be required to determine whether these alterations would impact flooding conditions on adjacent fields, especially the field immediately west of the proposed mitigation site.

The ISGS suggests that the eligibility of the Eckman property for mitigation purposes be verified with the Soil Conservation Service and other interested agencies.

SITE SUMMARY

Field observations and discussion presented regarding this site are summarized in two measures. **Mitigation potential** is an estimation of the hydrogeologic success of future mitigation at this site. **Potential functional value** is an estimation of the function and value of future mitigation at this site. Each measure may be justified by some of the characteristics listed below. Other characteristics may also be taken into account if warranted by the judgement of the observer and will be listed.

Mitigation potential- (HIGH)¹

Justification: Wetland creation on the Eckman property would be the restoration of a former wetland. The entire site is covered by hydric soils. Water is available from surface runoff and from a high water table. The slow permeability of the soils covering the site will enhance water retention. Only minor modifications, such as blocking drainage, will be required for wetland restoration. Extensive excavation will not be necessary.

Potential functional value- (MODERATE)²

Justification: The proposed mitigation is bordered by a 7-hectare (17-acre) wetland on the east. Another wetland exists south of the proposed mitigation site, but is hydrologically separated from the site by Schneider ditch. Immediately north and south of the site are two agricultural fields. The potential exists for runoff containing agricultural chemicals to enter the site from these fields.

The site is near but not adjacent to the Horse Shoe Lake State Park and the Cahokia Mounds Historic site. However, public access to the site is limited, because it is surrounded by private property.

The restored wetland will increase flood storage, wildlife habitat, landscape integrity, cultural activity, soil stabilization, and reduce water energy. The wetland will also enhance removal of sediments, nutrients, and contaminants.

^{1,2} Explanation of Categories

1. The following characteristics may be used to justify each category of mitigation potential. It is expected that sites will have characteristics from more than one category and that professional judgement will be applied to assign appropriately a rating.

High mitigation potential: mitigation to be performed is restoration of former hydrology, hydric soils are present, water sources to be used are apparent, multiple water sources likely, site is interspersed with or adjacent to present wetlands, land surface has been drained or altered, excavation not required, geology and geomorphology are favorable.

Moderate mitigation potential: some hydric soils or hydric soils indicators are likely present, water sources are somewhat apparent, multiple water sources are possible, site is adjacent to wetlands, land surface may be drained or altered, geology and geomorphology may be favorable.

Low site mitigation potential: mitigation to be performed is not restoration of former hydrology, hydric soils are not present, water sources to be used are not apparent, water sources are limited, site is not adjacent to wetlands, land surface has not been altered or drained, excavation required, geology and geomorphology not favorable.

2. The following characteristics may be used to justify each category of potential functional value. It is expected that sites will have characteristics from more than one category and that professional judgement will be applied to assign an appropriate rating.

High potential functional value: site will perform multiple or locally important functions, site in or adjacent to high quality habitat, buffer zone exists, compatible surrounding land usage, will not receive runoff from development, large size, managed by a conservation group.

Moderate potential functional value: site may perform multiple or locally important functions, site near high quality habitat, some buffer zone present, mostly compatible surrounding land usage, possibly receives some runoff from development, medium size, potential management by conservation group.

Low potential functional value: site may perform few functions or function poorly, not adjacent to high quality habitat, little or no buffer zone exists, some incompatible surrounding land usage exists, receives runoff from development, small size, no management by conservation group.

WETLAND FIELD DATA
Initial Site Evaluation

Site name and location:

The Eckman property is located in Madison County 2.2 km (1.4 miles) west of Collinsville and 1.6 km (1 mile) north of State Park Place.

Date of ISE:

Nancy Rorick conducted the ISE on November 14, 1994.

Township, range, and (1/4, 1/4, 1/4) section:

T3N, R9W, Section 25 SE/4 NE/4
Monks Mound Quadrangle
Illinois 7.5' Series Topographic

Site size:

16.2 hectares (40 acres).

Weather conditions and recent trends:

According to a local resident, it had rained from 3:00 to 11:00 am on the day of the ISE. During the ISE, the sky was overcast, temperature was 16° C (60° F). The weather station at Belleville, Illinois (located approximately 21.1 km (13.2 miles) south of the proposed mitigation site) recorded 13.2 mm (0.52 inches) of rain on the day of the ISE (precipitation data from the Illinois State Water Survey). Prior to the ISE, the station at Belleville received 89.9 mm (3.54 inches) on November 3-6 and 7.6 mm (0.30 inches) on November 9.

The average yearly precipitation for Madison County is 935.2 mm (36.82 inches) and the growing season is from mid-March to mid-November (SCS, 1986).

Land use of site, buffer area, and surrounding area:

The proposed mitigation site is an agricultural field, it is bordered on the north and west by agricultural fields and on the east and south by forested and scrub-shrub wetlands. Cahokia Canal is 137 m (450 ft) east of the site.

Prior history of site and buffer areas:

A 1904 topographic map shows that the proposed mitigation site was once part of a long, narrow, and continuous wetland that extending from 0.2 miles south of the present location of IL 162 (T3N, R8W, NW/4 SE/4 Sec 5) down to the north edge of East Saint Louis in St. Clair County (USGS, 1904). This wetland was 16.5 km (10.4 miles) long and varied in width from 0.2 -1.8 km (0.1- 1.1 miles). Cahokia Creek, which had not yet been channelized in 1904, flowed along the

western edge of this wetland. The unnamed **drainage**, which flows due west into Schneider Ditch, flowed into another unnamed drainage and **south to Canteen Creek**, and entered the wetland at the north edge of the present location of **State Park Place**. Canteen Creek no longer exists, having been replaced by a drainage ditch.

By 1955, the wetland is no longer continuous, Cahokia Creek has been channelized, and Schneider ditch has been constructed (USDA aerial photographs, 1955). However, the proposed mitigation site remained a wooded area in 1955.

In 1988 the landowner, Mr. Eckman claimed that his field flooded due to increased flow in Schneider ditch as the result of IDOT maintenance of the ditch upstream of his property (M. Vanderhoof, IDOT District 8, pers. comm.).

Relationship of site to cultural features:

The proposed mitigation site is 2.1 km (1.3 miles) northeast of the Cahokia Mounds Historic Site, 0.6 km (0.4 miles) west of I-255, and 2.9 km (1.8 miles) east of Horse Shoe Lake.

Bedrock geology:

The depth to bedrock from the land surface is around 33.5 m (110 ft) (ISGS well logs). The proposed mitigation site overlies the contact between the Mississippian age Lower Chesterian Formation on the west side and the Pennsylvanian age Spoon River Formation on the east side (Willman et al., 1967). The Lower Chesterian contains formations of limestone and shale alternating with formations of sandstone and shale (Willman et al., 1975). The Spoon Formation consists of sandstones, limestones, and coal.

Sediments:

The sediments filling the Mississippi River valley consist of the Henry Formation overlain by the Cahokia Alluvium (Berg and Kempton, 1988). The Henry Formation consists of sand-and-gravel glacial outwash deposits; the Cahokia Alluvium contains post-glacial deposits of silt, clay, and clayey sand (Willman and Frye, 1970). Three ISGS well logs within 0.6 km (0.38 miles) of the site indicate that between 2.7-9.1 m (9-30 ft) of clay overlies sand.

Soils:

The dominant soil on the proposed mitigation site is the Beaucoup silty clay loam (SCS, 1992). The Wakeland silt loam covers about 12% of the site in the southwest corner. Both soils are listed as hydric (SCS, 1986). The Beaucoup is a dark-gray, poorly-drained to very-poorly-drained soil with moderately-slow permeability. It has a seasonally high water-table from March through June varying from 0.15 m (0.5 ft) above the land surface to 0.6 m (2 ft) below the land surface. The Wakeland is a dark-grayish-brown, somewhat-poorly-drained, moderately-permeable soil. March through June it has a seasonally high water table 0.3-0.9 m (1-3 ft) below the land surface, and is frequently flooded for brief periods from March through May.

Topography:

The proposed mitigation site is nearly level and occupies an area 1.5-3.0 m (5-10 feet) lower in elevation than the surrounding landscape (USGS, 1993).

Geomorphic setting:

The proposed mitigation site is part of a former oxbow lake that has partially filled in with sediment. The former oxbow lake occupied an abandoned meander bend of the Mississippi River. West of the site, the landscape has the ridge and swale topography that is typical of the inside of a meander bend. Horseshoe Lake, west of the proposed mitigation site, is another, younger oxbow lake occupying a former channel.

Surface water:

Schneider ditch, which flows from the east under I-255, diverts into the south wetland, flows through a culvert into the ditch that borders the southern edge of the proposed mitigation site, and then discharges through a culvert into the Cahokia Canal (Attachment 2). The ditch had recently been dredged west of the proposed mitigation site and east of Cahokia Canal.

The proposed mitigation site lies within the floodplain of the Mississippi River, but is protected from most Mississippi River flooding by levees. The author has observed that Cahokia Canal is subject to backwater flooding from the Mississippi River.

Water flows onto the mitigation site from the fields north and east of the site, coalescing into a single drainage way. The water depth in this drainage way varied from 0.1-0.3 m (4-12 inches). Water from the drainage ways flows south through a culvert at the south end of the site into Schneider ditch (Attachment 2). The author observed water flowing into this culvert toward the ditch. However, the water level on the north side of the culvert was nearly the same as that in Schneider ditch. This indicates that when the water level is high in Schneider ditch, water may back up into the field.

On the north edge of the east wetland, water flows west in a well-defined ditch that turns south at the east edge of the proposed mitigation site (Attachment 2). Water from this ditch disperses into the east wetland. At the south end of the east wetland water discharges through a culvert into Schneider ditch. On the east edge of the mitigation site is a drainage that connects the east wetland to the drainage way in the center of the proposed mitigation site. Flow direction in the connecting drainage way was indeterminate.

Ground water:

The East Saint Louis area is underlain by a large sand and gravel aquifer comprised of the Henry Formation and more recent coarse-grained deposits of the Cahokia Alluvium. The regional direction of ground-water flow in this aquifer at the proposed mitigation site is toward the southwest (Kolhase, 1987). On November 14, 1994 the author observed water in an open borehole (B-1) at a depth of 2 feet below the land surface (Attachment 2).

Classification of present wetlands types:

The south wetland is classified by the US Fish and Wildlife Service (USFWS) as a palustrine forested wetland that is temporarily or seasonally flooded (USFWS, 1987). The east wetland contains areas classified as palustrine-emergent and palustrine-scrub-shrub wetlands.

Morphology of present wetlands:

The east and south wetlands are remnants of a much larger wetland system that once occupied the filled in oxbow. The east wetland is roughly rectangular and is bounded on all but the south side by agricultural fields. It receives surface water flow from a small ditch on its north edge (Attachment 2). Surface water appears to flow freely between the proposed mitigation site and the east wetland. Schneider ditch serves as a hydrological boundary that prevents water from flowing from the east wetland and the mitigation site to the south wetland. Instead water flows through culverts into Schneider ditch. The south wetland covers approximately 87 hectares (214 acres) and the east wetland covers approximately 7 hectares (17 acres).

Estimated Present and Potential Functions of Mitigation Site

Potential Functions	Present	Potential*
Surface water storage:	moderate	moderate to high
Subsurface water storage:	low	low
Reduce water energy:	moderate	high
Ground water discharge:	low	low
Ground water recharge:	low to moderate	low to moderate
Stabilize soil:	moderate	high
Remove nutrients:	moderate	high
Remove contaminants:	moderate	high
Remove sediment:	moderate	high
Animal/plant habitat:	moderate	high
Landscape integrity:	moderate	high
Cultural activity:	low	moderate

- * Potential functions are estimated given the possible options available for mitigation noted during the site evaluation. Only those areas likely to be altered are considered in this functional analysis.

ACKNOWLEDGEMENTS

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ATTACHMENTS

1. Site location map.
2. Site features map.

Attachment 1. Site location map.

